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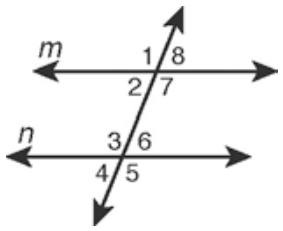
3-3 Assignment: Proving Lines Parallel



Use the figure. Tell whether lines m and n must be parallel from the given information. If they are, state your reasoning. (Hint: The angle measures may change for each exercise, and the figure is for reference only.)

1.

$\angle 7 \cong \angle 3$

2.

$m\angle 2 = (5x + 3)°$, $m\angle 3 = (8x - 5)°$,
$x = 14$

3.

$\angle 5 \cong \angle 7$

4.

$\angle 1 \cong \angle 5$

5.

$m\angle 6 = (x + 10)°$, $m\angle 2 = (x + 15)°$

"I got you ten roses. I believe strong relationships are based on the metric system."

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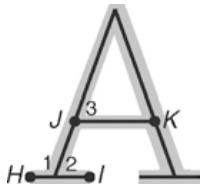
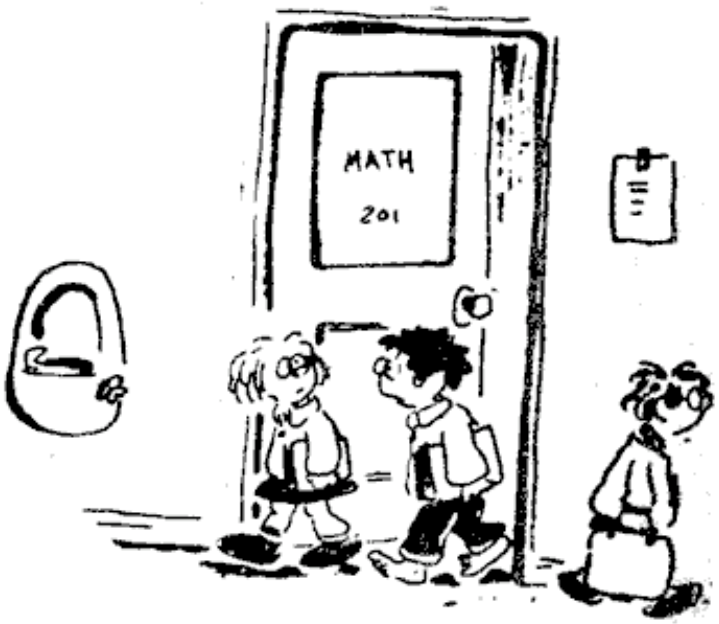
6.

Look at some of the printed letters in a textbook. The small horizontal and vertical segments attached to the ends of the letters are called *serifs*. Most of the letters in a textbook are in a serif typeface. The letters on this page do not have serifs, so these letters are in a sans-serif typeface. (*Sans* means "without" in French.) The figure shows a capital letter *A* with serifs. Use the given information to write a paragraph proof that the serif, segment $\overline{HI}$, is parallel to segment $\overline{JK}$.

Given: $\angle 1$ and $\angle 3$ are supplementary.

Prove: $\overline{HI} \parallel \overline{JK}$





"Wow, what a tough exam. I ran out of fingers."

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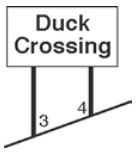
7.
In the sign, $m\angle 3 = (3y + 7)°$, $m\angle 4 = (5y + 5)°$, and $y = 21$.
Show that the sign posts are parallel.



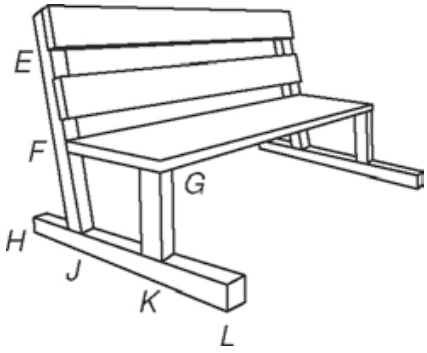
8. _____
In the bench, $m\angle EFG = (4n + 16)°$, $m\angle FJL = (3n + 40)°$, $m\angle GKL = (3n + 22)°$, and $n = 24$. Which is a true statement?

A $\overline{FG} \parallel \overline{HK}$ by the Converse of the Corr. ∡ Post.

B $\overline{FG} \parallel \overline{HK}$ by the Converse of the Alt. Int. ∡ Thm.

C $\overline{EJ} \parallel \overline{GK}$ by the Converse of the Corr. ∡ Post.

D $\overline{EJ} \parallel \overline{GK}$ by the Converse of the Alt. Int. ∡ Thm.



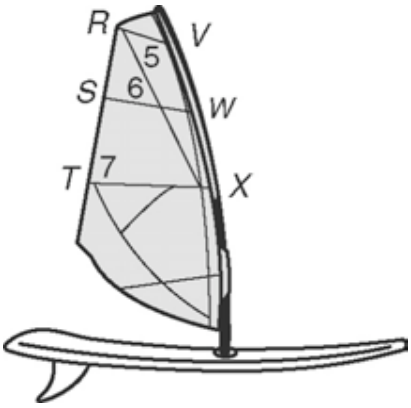
9. _____
In the windsurfing sail, $m\angle 5 = (7c + 1)°$, $m\angle 6 = (9c - 1)°$, $m\angle 7 = 17c°$, and $c = 6$. Which is a true statement?

F $\overline{RV}$ is parallel to $\overline{SW}$.

G $\overline{SW}$ is parallel to $\overline{TX}$.

H $\overline{RT}$ is parallel to $\overline{VX}$.

J Cannot conclude that two segments are parallel



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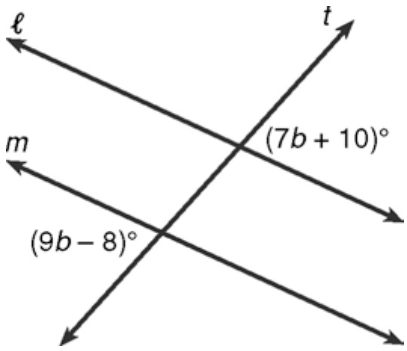
The figure shows Natalia's initials, which are monogrammed on her duffel bag.

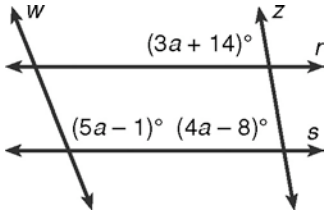
10. If $m\angle 1 = (4x - 24)°$, $m\angle 2 = (2x + 8)°$, and $x = 16$, show that the sides of the letter N are parallel.

11. If $m\angle 3 = (7x + 13)°$, $m\angle 4 = (5x + 35)°$, and $x = 11$, show that the sides of the letter H are parallel.

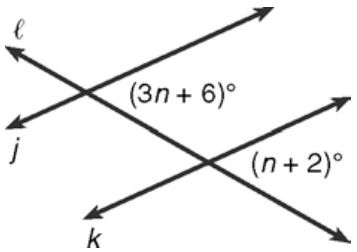
12. In the figure, what value of the variable *b* guarantees that lines and *m* are parallel?



13. Find the value of a that guarantees r || s.



14. Refer to the figure. Explain why it is not possible to find a value of *n* that guarantees *j* || *k*.



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15.

Write About It Does the information given in the diagram allow you to conclude that $a \parallel b$? Explain.